

WHAT IS CLAIMED IS:

1. A fuel cell system, comprising:
  - a fuel cell,
  - an exhaust gas circulation passage which circulates part of the exhaust gas from the fuel cell back to the fuel cell,
  - a fuel injection mechanism which injects liquid fuel into the circulated exhaust gas, and
  - a vaporizer which vaporizes the injected fuel.
2. The fuel cell system as defined in Claim 1, further comprising:
  - a circulation blower which is provided downstream to the vaporizer and blows the circulated exhaust gas under pressure.
3. The fuel cell system as defined in Claim 1, further comprising:
  - a water feeder which supplies water to the circulated exhaust gas.
4. The fuel cell system as defined in Claim 3, wherein:
  - the water feeder comprises a water injection mechanism which injects water into the circulated exhaust gas.
5. The fuel cell system as defined in Claim 4, wherein:
  - the water feeder is installed on the vaporizer.
6. The fuel cell system as defined in Claim 5, wherein:

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the water injection mechanism is installed upstream from the fuel injection mechanism.

7. The fuel cell system as defined in Claim 3, further comprising:

a sensor which detects the steam amount in the circulated exhaust gas upstream from the water feeder, and

a controller which functions to control the water supply amount from the water feeder according to the detected steam amount.

8. The fuel cell system as defined in Claim 1, comprising:

a sensor which detects a fuel amount in the circulated exhaust gas upstream from the fuel injection mechanism, and

a controller which functions to control the fuel injection amount from the fuel injection mechanism according to the detected fuel amount.

9. The fuel cell system as defined in Claim 1, wherein:

the fuel cell is a solid oxide fuel cell.

10. The fuel cell system as defined in Claim 9, wherein:

the exhaust gas circulation passage circulates the anode exhaust gas of the fuel cell.

11. The fuel cell system as defined in Claim 9, wherein:

the exhaust gas circulation passage circulates the cathode exhaust gas of the fuel cell.

12. The fuel cell system as defined in Claim 1, further comprising:  
a reformer which reforms fuel gas upstream from the fuel cell.

13. The fuel cell system as defined in Claim 1, wherein:  
the fuel cell performs an internal fuel reforming.